DRAWING AMENDMENTS

Submitted herewith is a marked-up version of the amended drawings, in accordance with 37 C.F.R. §1.121(d). The amended drawings comprise sheets 1 and 4 labeled as Figures 1 and 4. Also submitted are replacement sheets.

REMARKS

Elected Claims

The election of claims 1-15 and 18-29 (Group 1) is hereby affirmed.

Information Disclosure Statement

The IDS filed on October 3, 2003 was not considered because of the format in which it was submitted. The references are resubmitted for consideration in an IDS enclosed with this amendment.

Drawings

(1) The drawings were objected to under 37 CFR 1.83(a) as failing to show the arrangement for opening and closing and varying the rate of opening/closing of upper housing 104 and lower housing 134 as described in the specification (paragraph **[0028]**). However, paragraph **[0028]** states, "Mechanical assembly 102 drives the opening and closing of SPC 100, i.e. it brings together or separates the upper housing 104 and lower housing 134 to close or open SPC 100. The rate of closure and opening of the upper housing 104 and lower housing 134 may be varied by mechanical assembly 102, and other components (not shown)." Thus, mechanical assembly 102 is identified as driving opening and closing. Mechanical assembly 102 is shown in Figures 4 and 6-8. Therefore, it is submitted that the drawings comply with 37 CFR 1.83(a).

Furthermore, it is not understood how such an arrangement is considered to be "essential for a proper understanding of the disclosed invention" as indicated by the Office Action. It is pointed out that Figures 2 and 3 of the present application and the corresponding text of the background portion show opening and closing of an oven as "prior art."

(2) The drawings were also objected to because reference numbers 132 and 133 of Figure 4 referred to the same part. An amended drawing is submitted showing reference number 133 referring to proximity pins 133 as shown in Figures 6 and 8. In addition, Figure 1 is amended so that proximity pins 34 are identified as shown in Figure 2.

Specification

(1) Paragraph **[0028]** of the specification was objected to because it discloses, "'Mechanical assembly 102 drives the opening and closing of SPC 100', whereas per Figures (4, 6-8) the mechanical assembly 102 has been shown to actuate plate 124," Office Action, page 4. However, this does not appear to be an informality because the drawings do not appear to be inconsistent with this text as discussed above. It is requested that this objection be withdrawn or that the objection be further explained. It appears that the objections to the drawings and paragraph **[0028]** are based on a perceived contradiction between Figures 6-8 and the written text. However, no contradiction is seen and clarification is requested so that a complete response may be provided.

(2) In paragraph **[0035]**, line 6, reference number 134 is replaced by reference number 132 as suggested in the Office Action.

Claims

Claim 1 was rejected under 35 USC 102(b) as anticipated by Ohkase (US Patent No. 6,111,225). Claim 1 is amended to recite, "the first temperature controlled plate comprising first proximity pins, the first proximity pins configured to distance the wafer from the first temperature controlled plate." This corresponds to limitations previously recited in claim 2 (now canceled). Thus, claim 1 as amended is similar to claim 2 prior to cancellation and the rejection of claim 2 is addressed in this response.

Claim 2 was rejected under 35 USC 103(a) as unpatentable over admitted prior art in view of Blersch (US Patent No. 5,965,047). However, all the elements of claim 1 as amended do not appear to be shown by the combination of the admitted prior art and Blersch. In particular, claim 1 recites, "the first temperature controlled plate comprising first proximity pins" and "a second temperature control plate comprising second proximity pins." Such first and second proximity pins do not appear to be disclosed or suggested by either admitted prior art or Blersch. While Blersch is cited as showing a heating plate 88 having pins and admitted prior art is also cited as showing proximity pins 32, both pins are in a similar configuration below a wafer. Neither Blersch nor admitted prior art appears to show first and second sets of pins extending

from first and second temperature controlled plates. The combination of two references, each showing a single plate with pins, would not appear to suggest a combination having two plates, each plate having pins.

No adequate motivation is provided to modify either admitted prior art or Blersch to obtain the claimed combination having two sets of pins. In particular, modifying Blersch to add second pins would appear to lack motivation because the position of heating plate 86 of Blersch appears to be fixed. MPEP 2143.01 states, "The prior art must suggest the desirability of the claimed invention." Because all the elements of claim 1 have not been shown in the cited references, and because no adequate motivation is shown to modify the cited references to produce the claimed combination, no *prima facie* case of obviousness is made with respect to claim 1. Therefore, it is requested that this rejection be withdrawn.

Claims 3-10 depend from claim 1 and are submitted to be allowable at least as depending from an allowable independent claim.

In addition, Claim 3 is amended to recite, "the proximity pins are moveable such that the distance between the first and second temperature controlled plates may be varied." This limitation is supported throughout the specification, in particular at paragraph **[0035]**. Claim 3 was rejected under 35 USC 103(a) as unpatentable over admitted prior art in view of Blersch and further in view of Ushikawa (US Patent No. 6,140,256). However, neither the admitted prior art, Blersch nor Ushikawa appear to show this feature. Both Blersch and Ushikawa appear to have plates that have fixed relative locations. Ushikawa only appears to show movement of the wafer, not relative movement of temperature controlled plates. The Office Action stated that the motivation to combine the references was, "to improve planar uniformity." However, it is not clear how the cited references suggest varying the distance between plates when Ushikawa only shows one plate. Because the claim elements have not been shown in the prior art, and because no adequate motivation has been provided to combine the references, no *prima facie* case of obviousness is made with respect to claim 3.

Claims 5 and 6 were rejected under 35 USC 103(a) over admitted prior art in view of Blersch and further in view of Dhindsa (US Patent No. 6,245,192). The Office Action indicated that admitted prior art in combination with Blersch did not teach a flow distribution manifold comprising laminar flow paths with laminar flow elements. Dhindsa was cited as showing these

features. Claims 5 and 6 are amended to clarify the claim language. It is submitted that claims 5 and 6 as amended contain claim elements not shown by the cited references. In particular, claim 5 recites, "each of the plurality of laminar flow paths comprising one laminar flow element controlling the flow rate of said flow path, the laminar flow element providing gas to one gas passage that leads to the exterior of the flow distribution manifold." This limitation is supported throughout the specification, in particular by Figures 4-5, and by paragraphs **[0032]-[0034]**. No such laminar flow paths appear to be shown by Dhindsa. Instead, Dhindsa appears to show channels 88 that provide gas to multiple gas passages in showerhead 22 (see Figure 4). Thus, claim 5 is submitted to be additionally allowable.

Claim 6 is amended to recite, "the laminar flow element comprises a horizontal channel formed in a surface of a substrate and the gas passage extends to an opposing surface of the substrate". No such substrate appears to be shown by Dhindsa. Dhindsa appears to show channel 88 formed in lower baffle 56B (see Figures 4 and 6). However, openings 54 are in showerhead 22 (see Figure 2 and column 4, line 52). Thus, claim 6 is submitted to be additionally allowable.

Claim 7 was rejected under 35 USC 103(a) as being unpatentable over admitted prior art in view of Blersch, Dhindsa and further in view of Nanyei (US Patent No. 5,580,830). This rejection is not clearly understood. The Office Action indicated that the combination of admitted prior art, Blersch and Dhindsa did not show a laminar flow path with a cavity. Nanyei was cited as showing this feature. However, Nanyei does not appear to teach or suggest a cavity connected to a flow path in the manner of claim 7. Claim 7 recites, "a cavity such that any contaminants or solvents that may be present in the enclosure and that may enter the flow paths will accumulate in the cavity rather than in the laminar flow elements." Nanyei appears to teach away from such a cavity because Nanyei teaches a restriction to prevent or reduce accumulation of contamination in a chamber (see column 2, lines 49-63). The motivation to combine Nanyei with the other references, "to minimize backflow of impurities to the chamber" is not understood and it is not clear what is meant by "chamber" in this context. It is not seen how the structure of Nanyei corresponds to the claim features and clarification is requested. In particular, it is requested that the elements of Nanyei that correspond to the cavity and laminar flow elements of claim 7 be

identified. Without such elements, a *prima facie* case of obviousness has not been made with respect to claim 7.

Claims 8 and 9 were rejected under 35 USC 103(a) as being unpatentable over admitted prior art in view of Blersch and further in view of Or (US Patent No. 6,364,949). Claim 8 recites, "the flow distribution manifold is in contact with the first temperature controlled plate." The Office Action stated that it would have been obvious to use a gas delivery assembly as taught by Or in the apparatus of the admitted prior art in view of Blersch. However, the references appear to teach away from such a combination. In particular, Blersch appears to teach a system that uses radiant heating. "The radiation from the lamps is directed through the transparent portions of the walls on to the surface of the object heated." Column 1, lines 23-26. The gas delivery assembly of Or includes showerhead 153 that extends over a substrate as shown in Figure 5. However, showerhead 153 is disclosed as being made of aluminum. "Preferably, the showerhead 153 is constructed of a material having a high thermal conductivity and low Rc such as an aluminum alloy," column 6, lines 54-56. The gas delivery assembly of Or also appears to be large. "In one embodiment, the showerhead 153 and plate temperature control plate 151 have a combined thickness, t3, of about 3.0 inches and a diameter, d3, of about 14.0 inches," column 7, lines 18-20. It is not seen how such a large gas delivery assembly of such opaque material would be compatible with the radiant heating of Blersch. Thus, this modification of Blersch would appear to make the apparatus of Blersch unsuitable for its intended purpose. MPEP 2143.01 states, "The proposed modification cannot render the prior art unsatisfactory for its intended purpose." Therefore, claims 8 and 9 are submitted to be allowable.

Claim 11 was rejected under 35 USC 102(b) as anticipated by Ohkase. Claim 11 is amended to recite, "a second temperature control element" and "the laminar flow paths formed as channels in a surface of a plate that is in thermal contact with the second temperature control element, an individual laminar flow path extending along a plane that is parallel to the plane of the wafer." These claim limitations are supported throughout the specification, in particular by Figures 4-5 and paragraphs **[0032]-[0034]**. Ohkase appears to show gas supply head 28 without channels in a surface of a plate (see Figure 2). Because Ohkase does not appear to show these claim features, it is believed that this rejection is overcome.

Claim 11 was further rejected under 35 USC 103(a) as unpatentable over admitted prior art in view of Brors (US Patent No. 5,551,985). Claim 11 recites the above limitations regarding the laminar flow path that do not appear to be disclosed by either admitted prior art or Brors. Assembly 150 and nozzles 152 of Brors appears to direct gas flow (see Figure 7). However, neither assembly 150 nor nozzles 152 appear to have channels in a plate or being in thermal contact with a temperature control element. Therefore, this rejection is believed to be overcome.

Claims 12-15 depend from claim 11 and are therefore submitted to be allowable at least for depending from an allowable independent claim. Claims 12-15 were rejected as unpatentable over admitted prior art in view of Brors and further in view of Or (US Patent No. 6,364,949). The Office Action stated that it would have been obvious to use a gas delivery assembly as taught by Or in the apparatus per admitted prior art in view of Brors to obtain minimum thermal gradient across the wafer. However, such a combination would appear to make an apparatus according to Brors unsatisfactory for its intended purpose, contrary to MPEP 2143.01. Also, it appears that Brors teaches away from such a combination. Adding the gas delivery assembly of Or to the apparatus of Brors would appear to add a large component between lamp assembly 43 and a wafer. It is not seen how this is compatible with the apparatus of Brors. "Infrared energy emitted from lamps 44a-44c in upper lamp assembly 43 heats a graphite thermal plate 54 positioned between approximately 0.5 and 0.75 inches above the top surface of wafer 12," Brors, column 4, lines 28-31. Placing such a gas delivery assembly above thermal plate 54 would appear to direct gas to the thermal plate, not the wafer. Placing the gas delivery assembly between thermal plate 54 and the wafer would appear to require displacing thermal plate 54 more than 0.75 inches ("In one embodiment, the showerhead 153 and plate temperature control plate 151 have a combined thickness, t3, of about 3.0 inches," Or, column 7, lines 17-19.) In addition, Brors discloses, "Thermal plate 54 preferably has a low thermal mass to allow for rapid thermal cycling of plate 54," column 4, lines 31-33. In contrast, Or discloses an assembly that is about 3 inches thick formed of an aluminum alloy. It is not seen how such an assembly could be considered to have low thermal mass. Thus, it appears that Brors teaches away from combination with a gas supply apparatus such as that of Or.

Claims 16 and 17 are withdrawn.

Claim 18 was rejected under 35 USC 102(b) as anticipated by Ohkase. Claim 18 is amended to recite, "the wafer spaced from the first heating plate by first proximity pins, the second heating plate spaced from the first heating plate by second proximity pins when the second heating plate is in a closed position, the second heating plate being more distant from the first heating plate when in an open position". These limitations do not appear to be shown by Ohkase because the heating vessels do not appear to be spaced by pins and heating vessel 8 appears to be stationary. Thus, it is believed that the rejection is overcome.

Claim 18 was also rejected under 35 USC 103(a) as unpatentable over admitted prior art in view of Blersch. Blersch was cited as showing the wafer spaced from first and second heating plates by proximity pins. However, Blersch does not appear to disclose "the second heating plate spaced from the first heating plate by second proximity pins." Also, Blersch does not appear to disclose a second heating plate having two positions because the heating plates of Blersch appear to be stationary. Because these claim elements have not been shown, claim 18 is submitted to be allowable.

Claims 19-22 depend from claim 18 and are therefore submitted to be allowable at least as depending from an allowable base claim.

Claims 19 and 22 were rejected as unpatentable over admitted prior art in view of Blersch and further in view of Dhindsa. However, the motivation to combine Dhindsa and Blersch is not clear for similar reasons to those discussed above with respect to the combination of Or and Blersch with respect to claims 12-15, i.e., the combination of a large opaque showerhead apparatus with the radiant heating system of Blersch does not appear to be suggested by the cited references.

Claims 20-21 were rejected as unpatentable over admitted prior art in view of Blersch and Dhindsa and further in view of Or. However, claim 21 recites, "the gas passes from the flow control system through passages in the first heating plate to the wafer." This does not appear to be shown by the cited references. In particular, Blersch does not appear to show gas passing through a plate. Dhindsa does not appear to show a heating plate. Or appears to show gas flow from temperature control plate 151 towards blocker plate 167 and showerhead 153. This appears to be the opposite to the order of claim 21. Also, Or appears to show only a single passage,

process gas inlet 159, through temperature control plate 151. Therefore, claim 21 is submitted to be allowable over the cited references.

Claims 23-25 are canceled.

Claims 26-28 were rejected as unpatentable over admitted prior art in view of Blersch and in view of Liu (US Patent No. 6,753,506). Claim 26 recites, "an enclosure surrounding the first and second temperature altering devices and the wafer ... the system operable to vary a rate of closure of any of the first or second temperature altering devices or the enclosure." No such enclosure appears to be shown by the cited references. In particular, it is noted that lid 33 and base 43 of Liu do not surround temperature altering devices and it is not suggested that they be modified to do so. In addition, Liu does not appear to disclose a variable rate of closure of lid 33 and base 34. No other variable rate of closure appears to be disclosed by Liu or the other cited references. Thus, combining the enclosure of Liu with the admitted prior art and Blersch would not provide a system according to claim 26. The Office Action does not appear to address these elements and thus fails to make a *prima facie* case of obviousness. Also, the motivation cited, "to improve throughput" is not well understood. It is not clear how combining the system of Blersch with the enclosure of Liu would improve throughput. It appears that the throughput benefits of Liu are realized where a heating chamber has a relatively large volume compared to an enclosure (see column 6, lines 38-51). It is not seen how this would apply to the system of Blersch. Indeed, Liu appears to acknowledge that lamp-based RTP systems such as Blersch inherently have higher throughput and lower chamber volume (see column 1, lines 35-60). It is not seen how this suggests modifying Blersch.

Claims 27 and 28 depend from claim 26 and are submitted to be allowable at least as depending from an allowable base claim.

Claim 29 was rejected as unpatentable over admitted prior art in view of Brors and in view of Liu. Claim 29 recites, "the device is operable to adjust the rate of opening and closure of the enclosure by varying one or more rates of movement of the first or second enclosing structures." These limitations do not appear to be shown by the references. In particular Liu does not appear to show varying rates of movement of lid 33 or base 34. Thus, all the elements of claim 29 have not been shown in the prior art. In addition, the motivation given (to improve throughput) is not understood as discussed with respect to claim 26.

New claims 30-35 are added and are believed to be supported throughout the specification, particularly by Figures 4-8.

Conclusion

Accordingly, it is believed that this application is now in condition for allowance and an early indication of its allowance is solicited. However, if the Examiner has any further matters that need to be resolved, a telephone call to the undersigned attorney at 415-318-1167 would be appreciated.

Respectfully submitted,

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Annotated Sheet Showing Changes

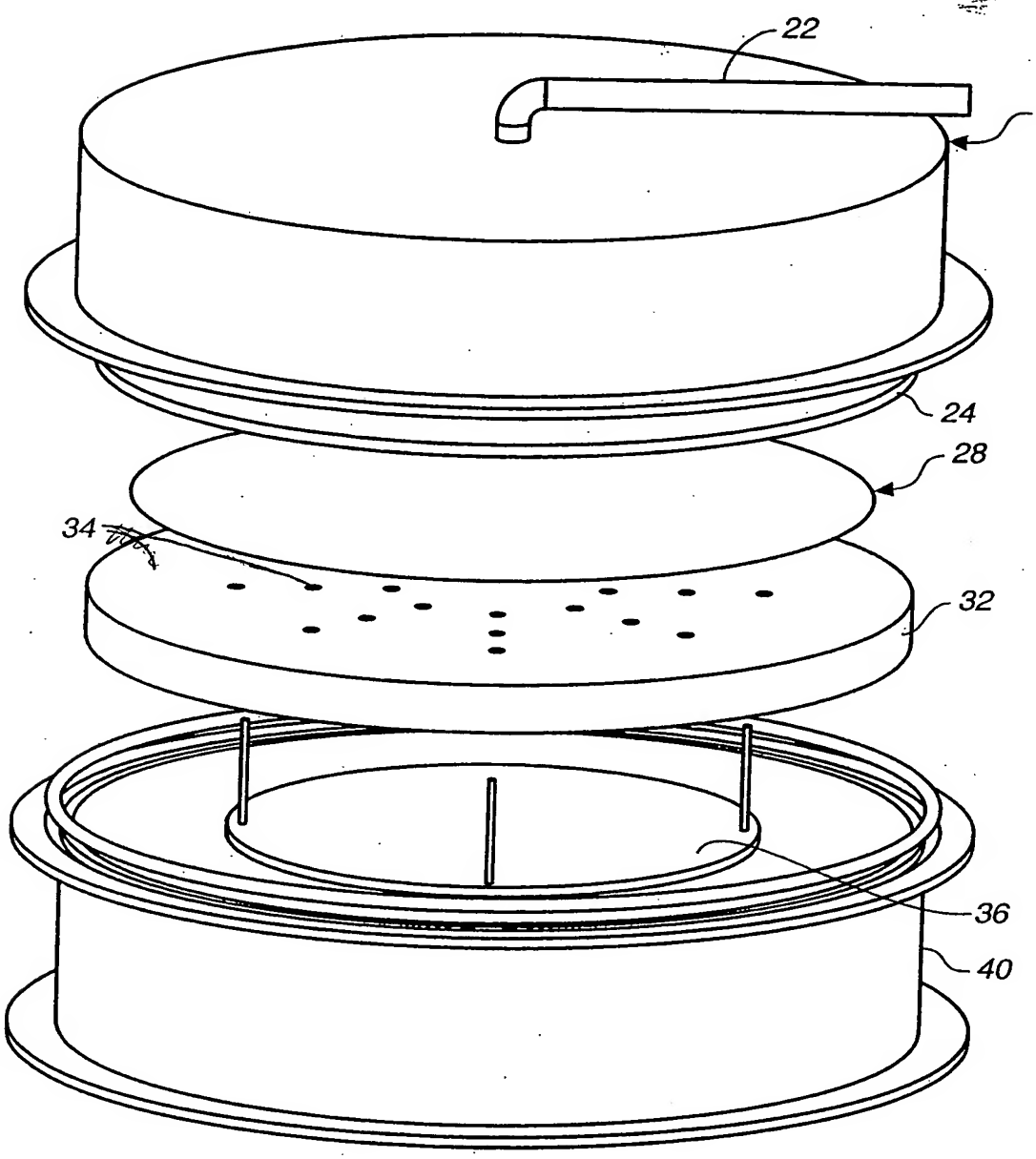

FIG._1
(PRIOR ART)

Annotated Sheet Showing Changes

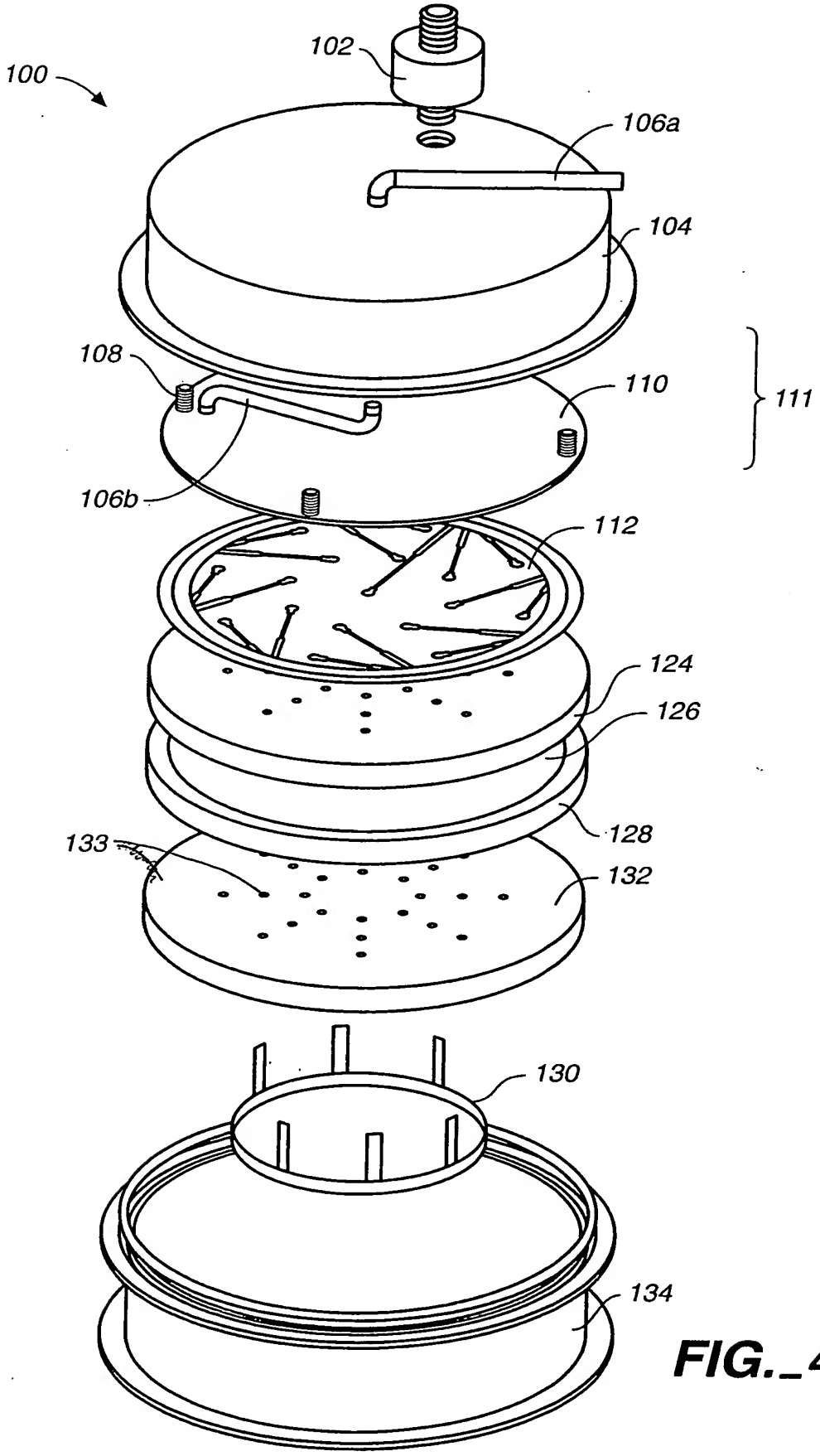

FIG._4